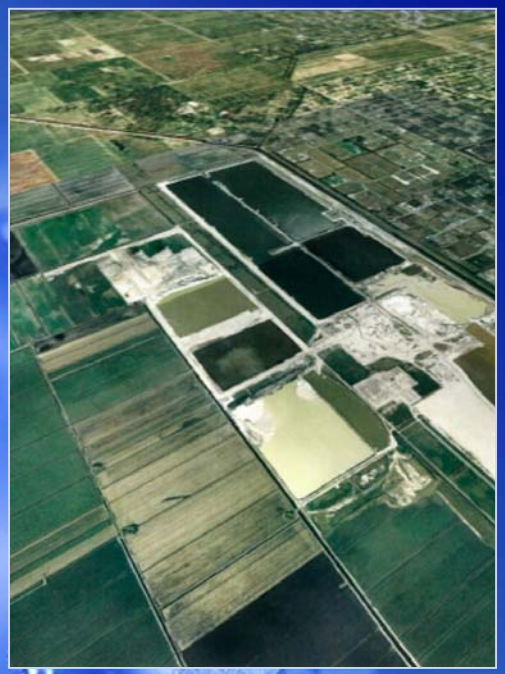


Conceptual Feasibility of a Sub-Regional Lower East Coast Water Supply Solution

Status Update to the Joint Broward County / Palm Beach County Water Resources Task Force

June 5, 2009

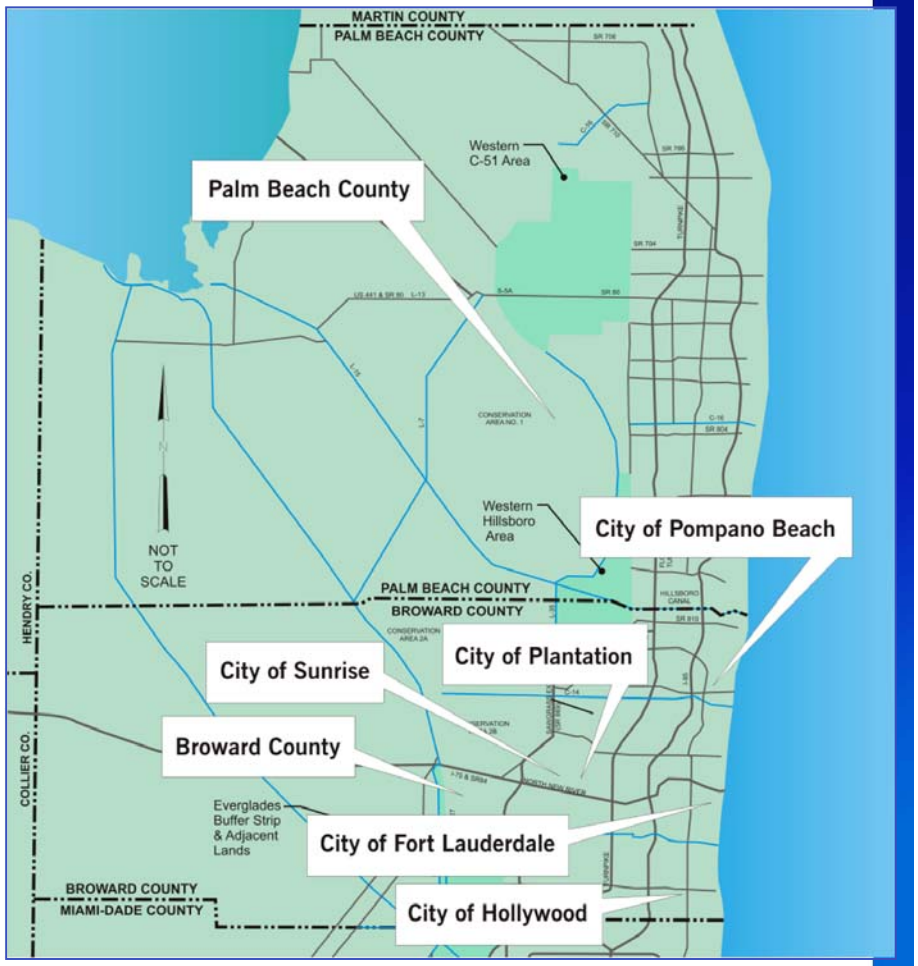
Presenters: Albert Carbon, P.E.
Brian Shields, P.E.

Purpose

- Meet environmental restoration objectives
- Respond to the need for additional potable water supplies in Southeast Florida
- Develop a framework for a Regional Water Supply Solution

Conceptual Feasibility of a Sub-Regional Lower East Cost Water Supply Solution

- 7 Utilities
  - Broward and Palm Beach Counties
    - Broward County, Palm Beach County, Sunrise, Plantation, Hollywood, Pompano Beach, and Fort Lauderdale.



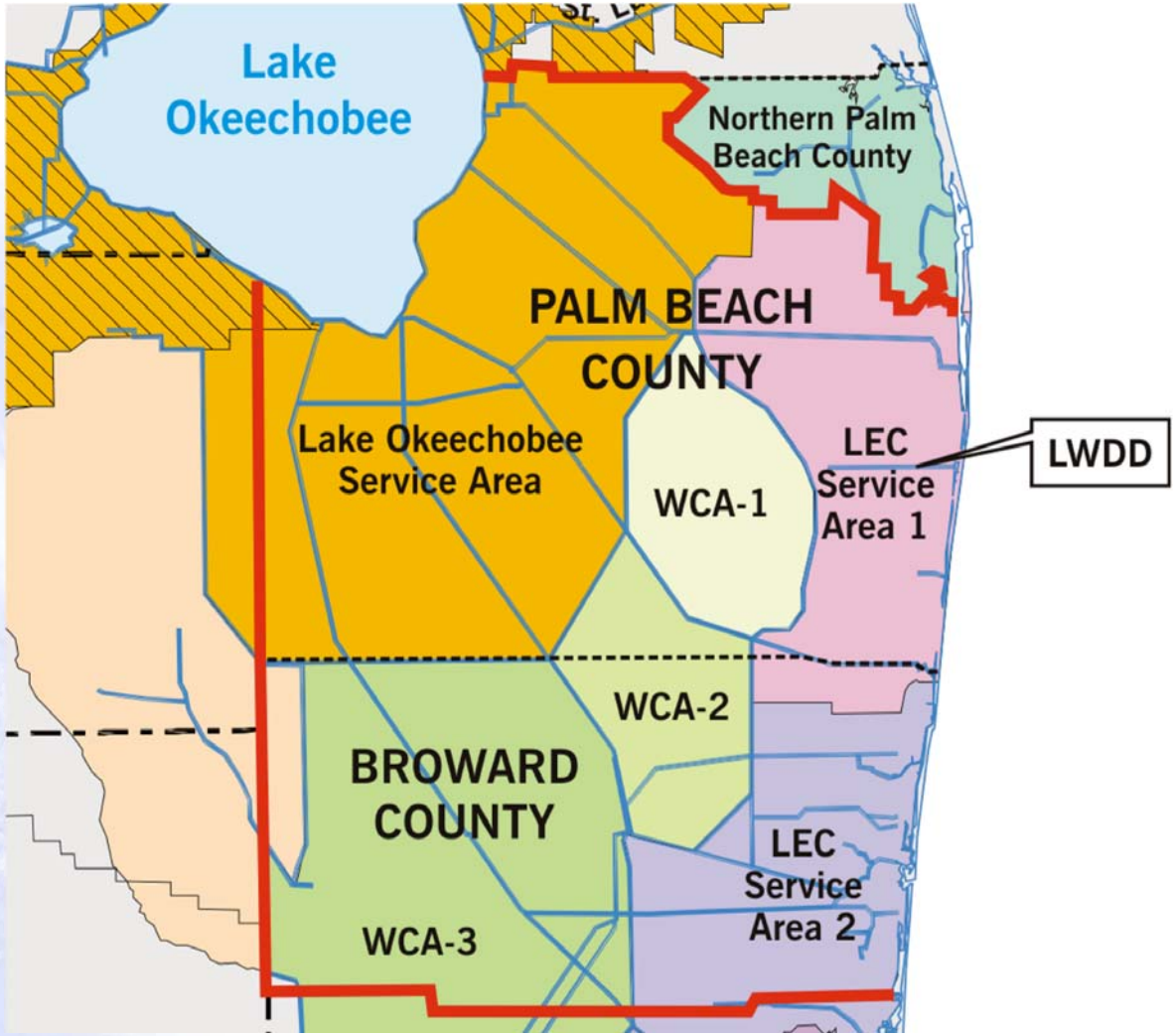
43000-036w-fn006

Conceptual Feasibility of a Sub-Regional Lower East Cost Water Supply Solution

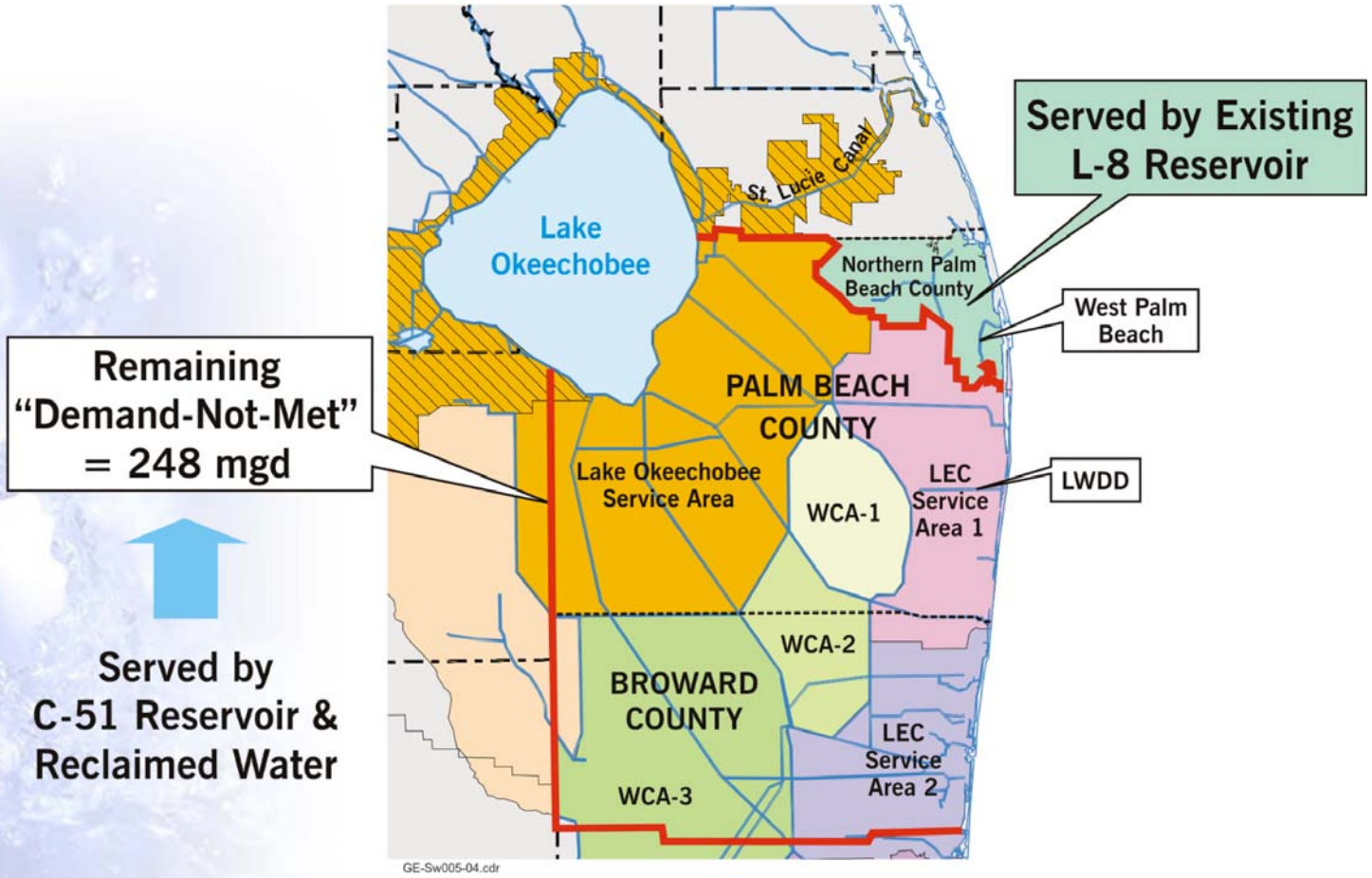
Interlocal Agreement: Signed January 2007

- Raw Water Requirements
- Alternative Water Supply Sources
- Hydrologic Modeling
- Facilities Plan
- Presentations / Meetings

Study Area



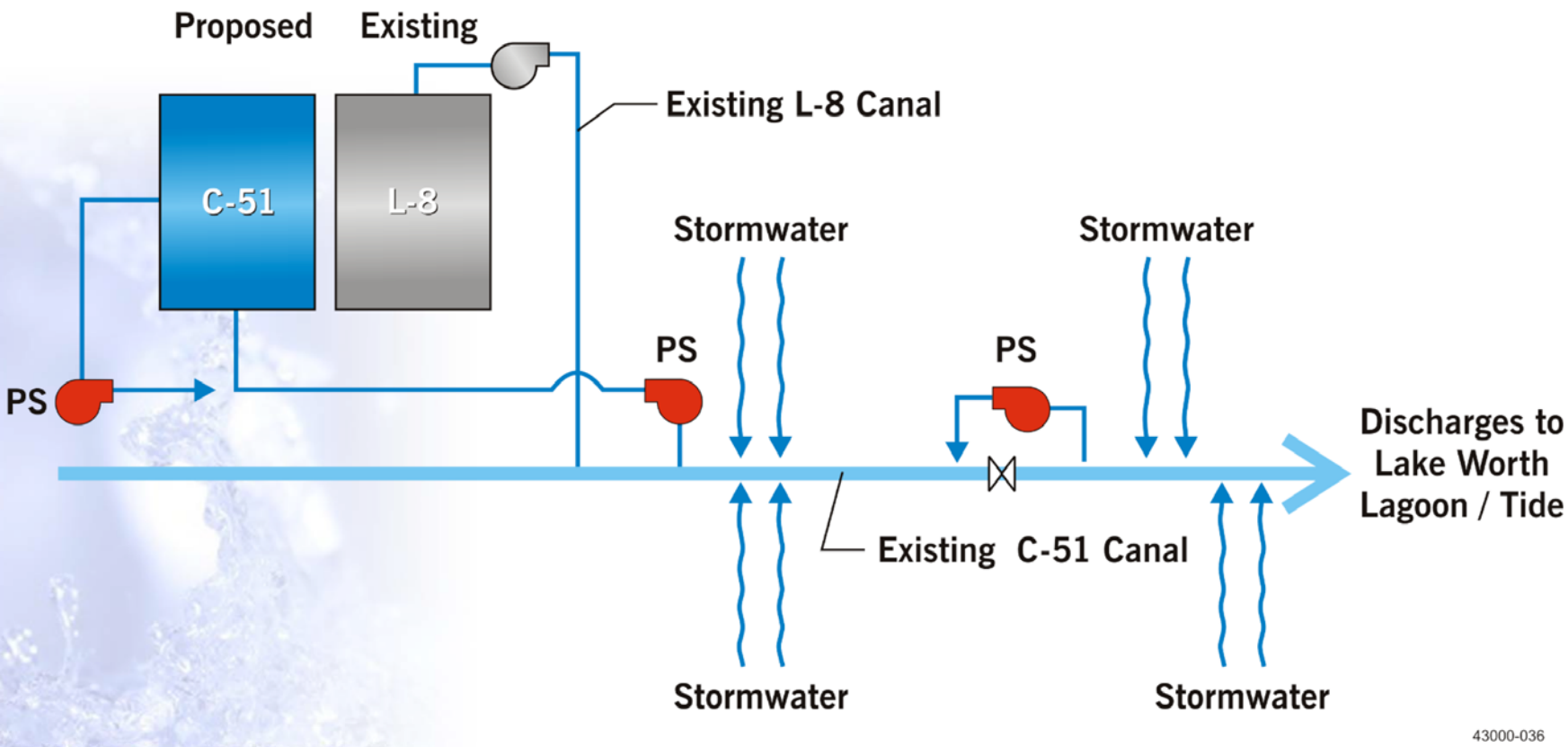
Results


Served by Existing
L-8 Reservoir
West Palm
Beach
LWDD
Remaining
"Demand-Not-Met"
= 248 mgd
Served by
C-51 Reservoir &
Reclaimed Water
Lake
Okeechobee
St. Lucie Canal
Northern Palm
Beach County
PALM BEACH
COUNTY
Lake Okeechobee
Service Area
WCA-1
LEC
Service
Area 1
WCA-2
BROWARD
COUNTY
LEC
Service
Area 2
WCA-3
GE-Sw005-04.cdr

Results (continued)

- Remaining 248 mgd “demand-not-met” requires 186 mgd new water (raw)
  - 248 mgd times 75% equals 186 mgd of raw water
  - 100 gallons of new water would allow extraction of 133 gallons.
- C-51 provides 120 mgd raw water
- ∴ 66 mgd other “Alternative Water Supply” required
- Environmentally beneficial
  - Lake Worth Lagoon
  - Smallest carbon footprint

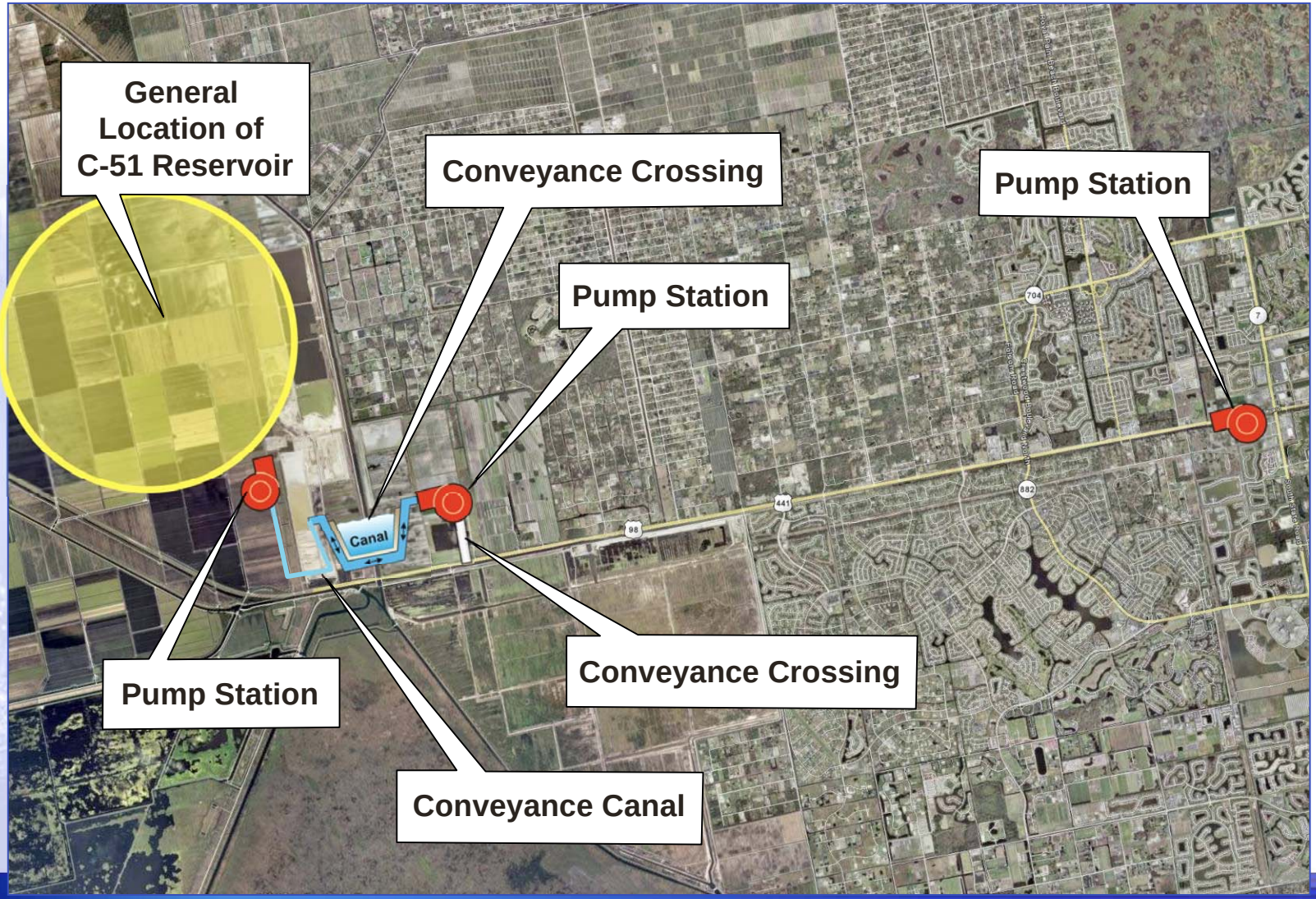
How to use C-51



Major Facilities

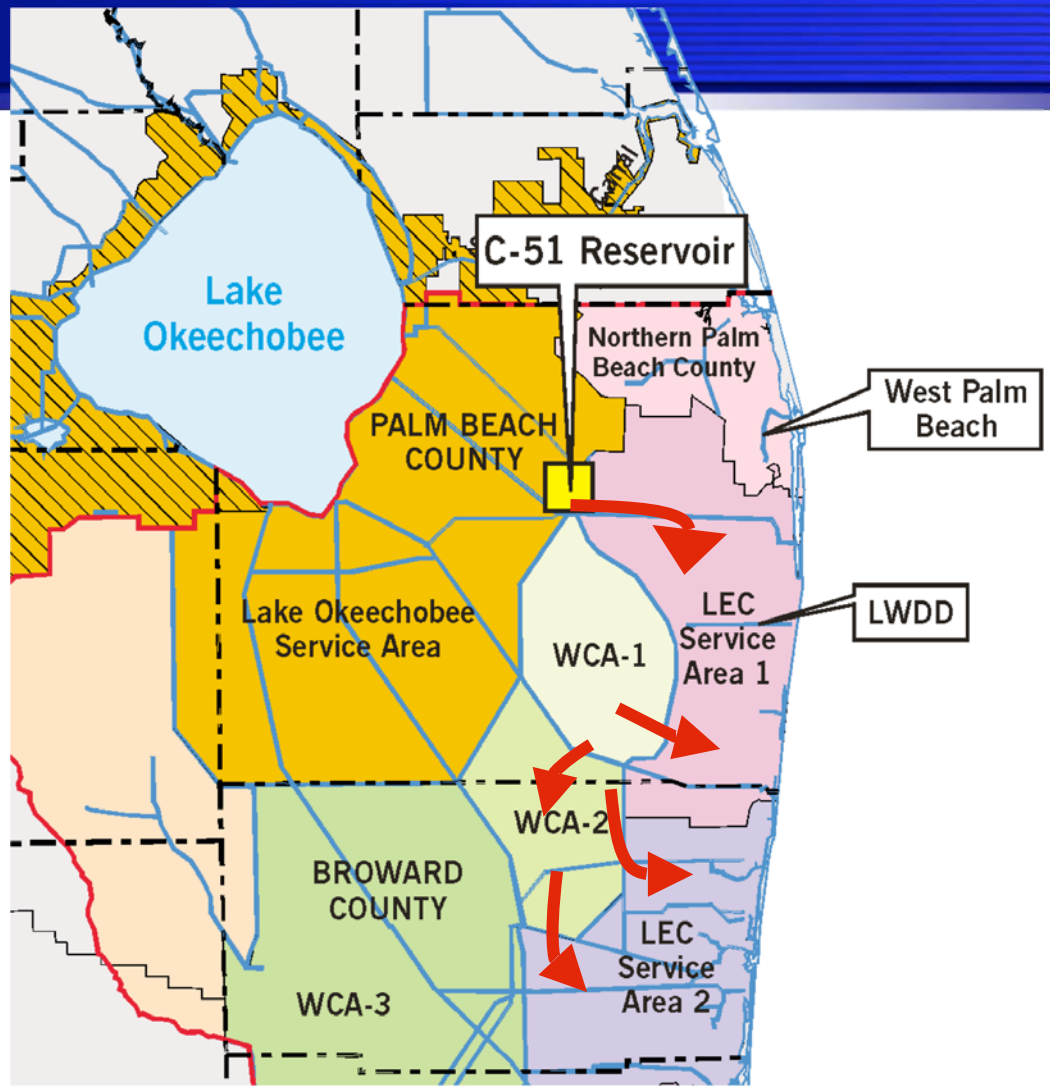
43000-036w-fn006

General facilities layout



43000-036w-fn006

Cascade Effect



43000-036w-fn006

C-51 Reservoir Capital Costs

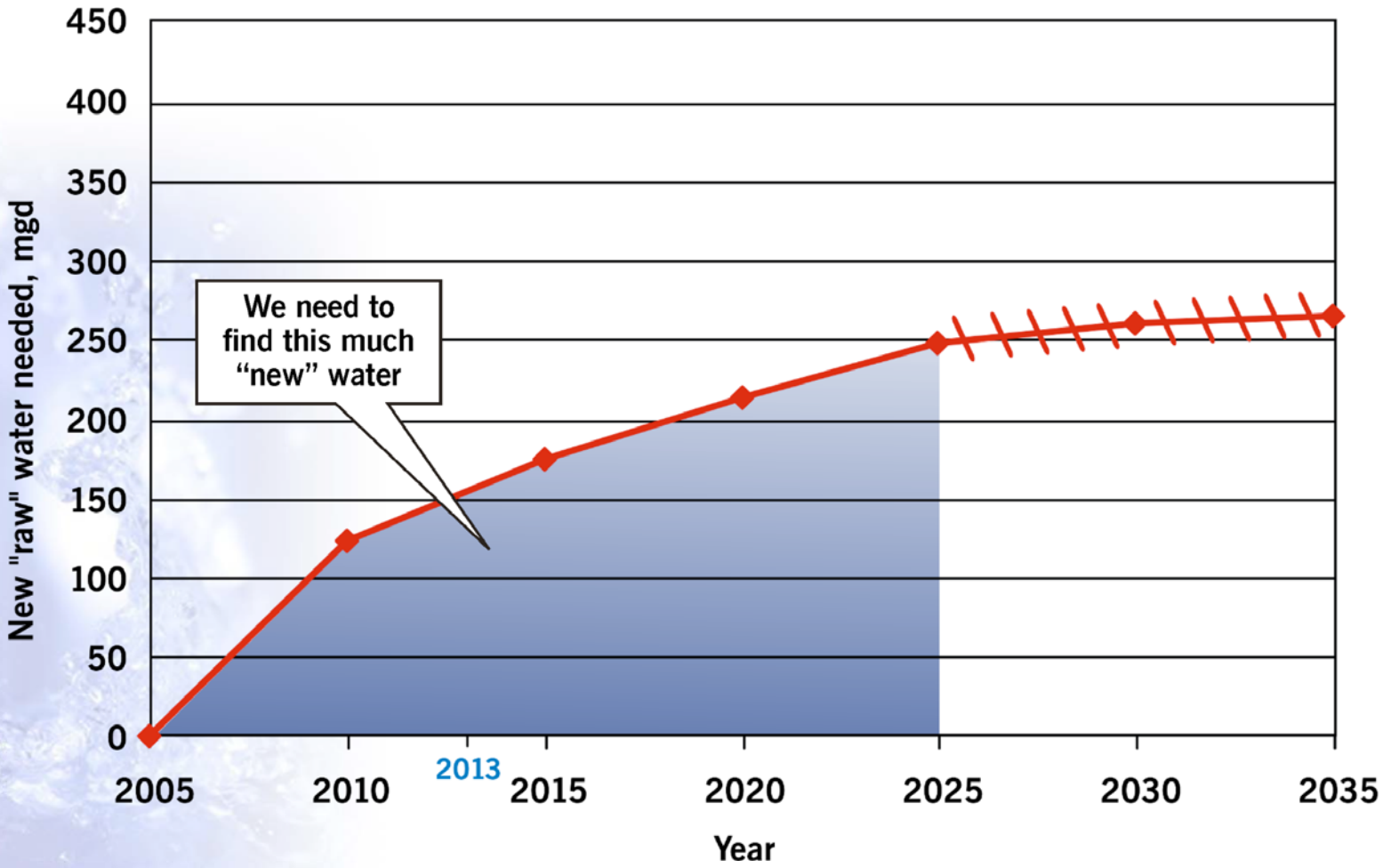
Component		Capital Cost (Millions)
1.	C-51 Reservoir Construction	$274
2.	C-51 Reservoir Water Supply Pump Station	$42
3.	S155A Pump Station	$9
4.	US98 / SR80 Conveyance Crossing	$6
5.	S5AE Pump Station	$11
6.	L-8 Canal Conveyance Crossing	$5
7.	C-51 Reservoir Conveyance Canal and Inflow Structure	$6
8.	Place holder for 298 District Improvements	$10(1)
Total:		**≈ $363**

Produces: 120 ÷ 0.75 = 160 mgd raw water
160 x 0.85 = 136 mgd finished water (assuming membrane treatment)
$363M ÷ 136 mgd **≈ $2.70/gal**

(1) Place holder

43000-036w-fn006

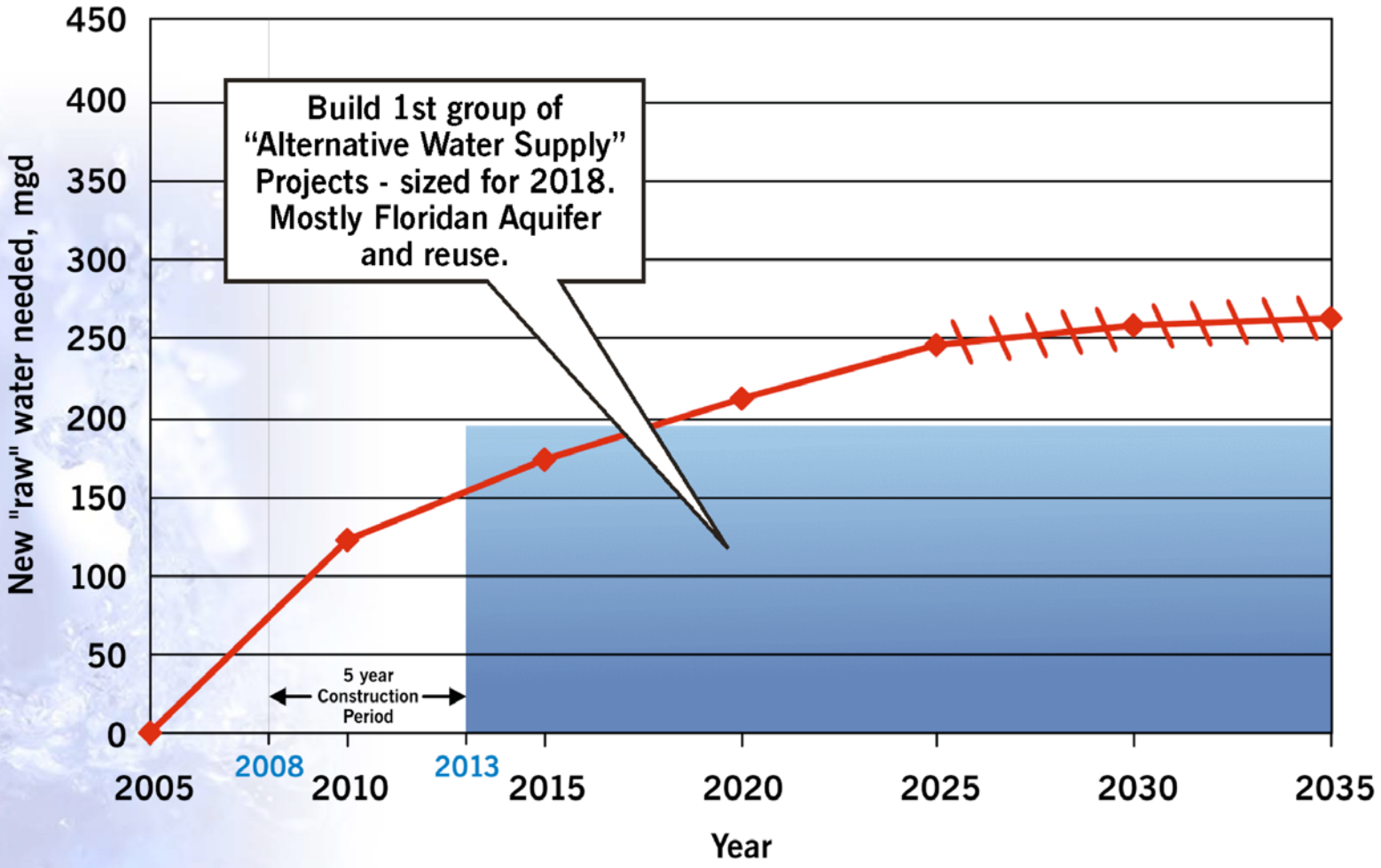
So where are we?



"New" water represents Palm Beach and Broward counties not including the North Palm Beach County Regional Service Area

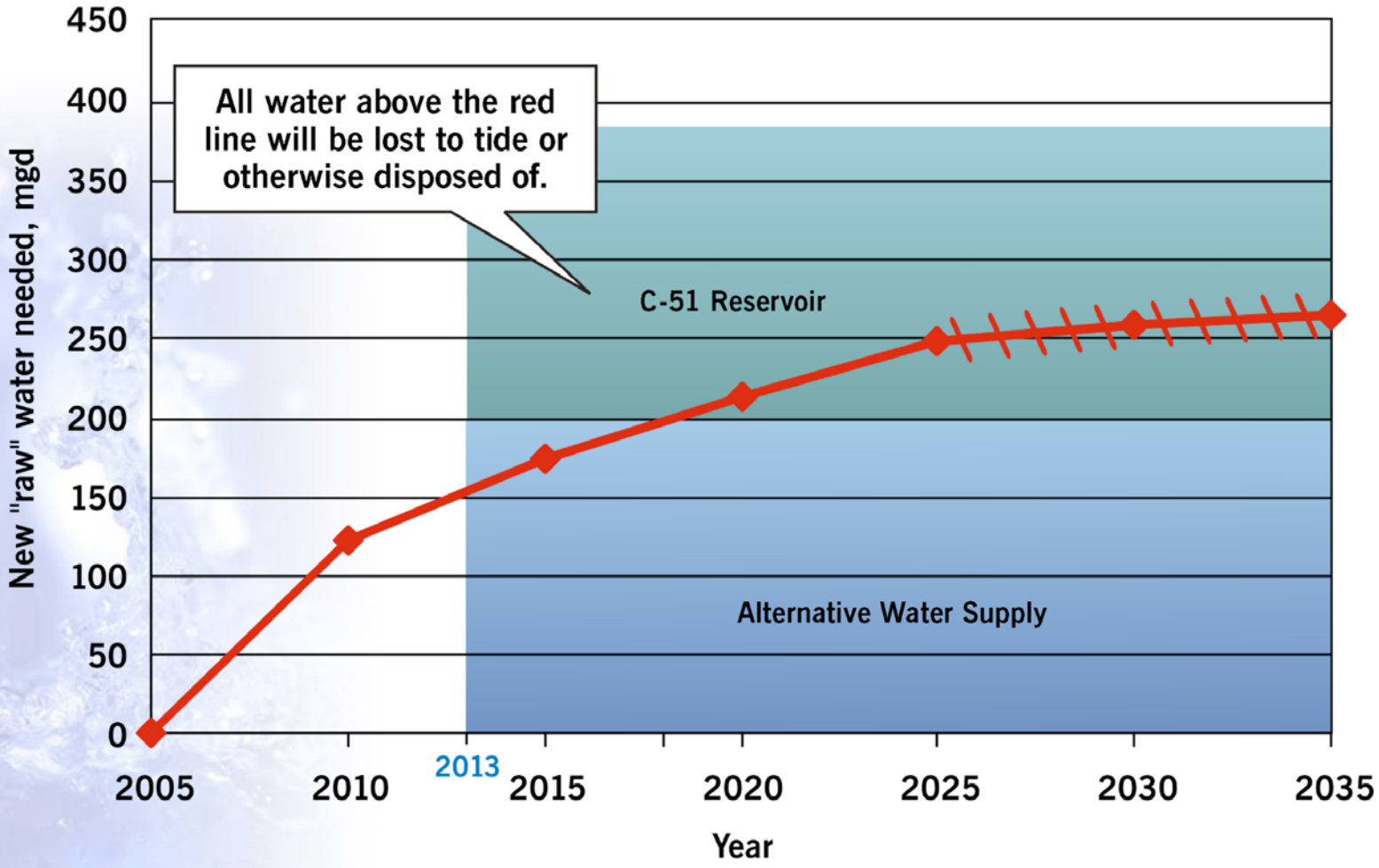
43000-036w-fn006

Current Efforts –
First Ten Years Mandated by DCA



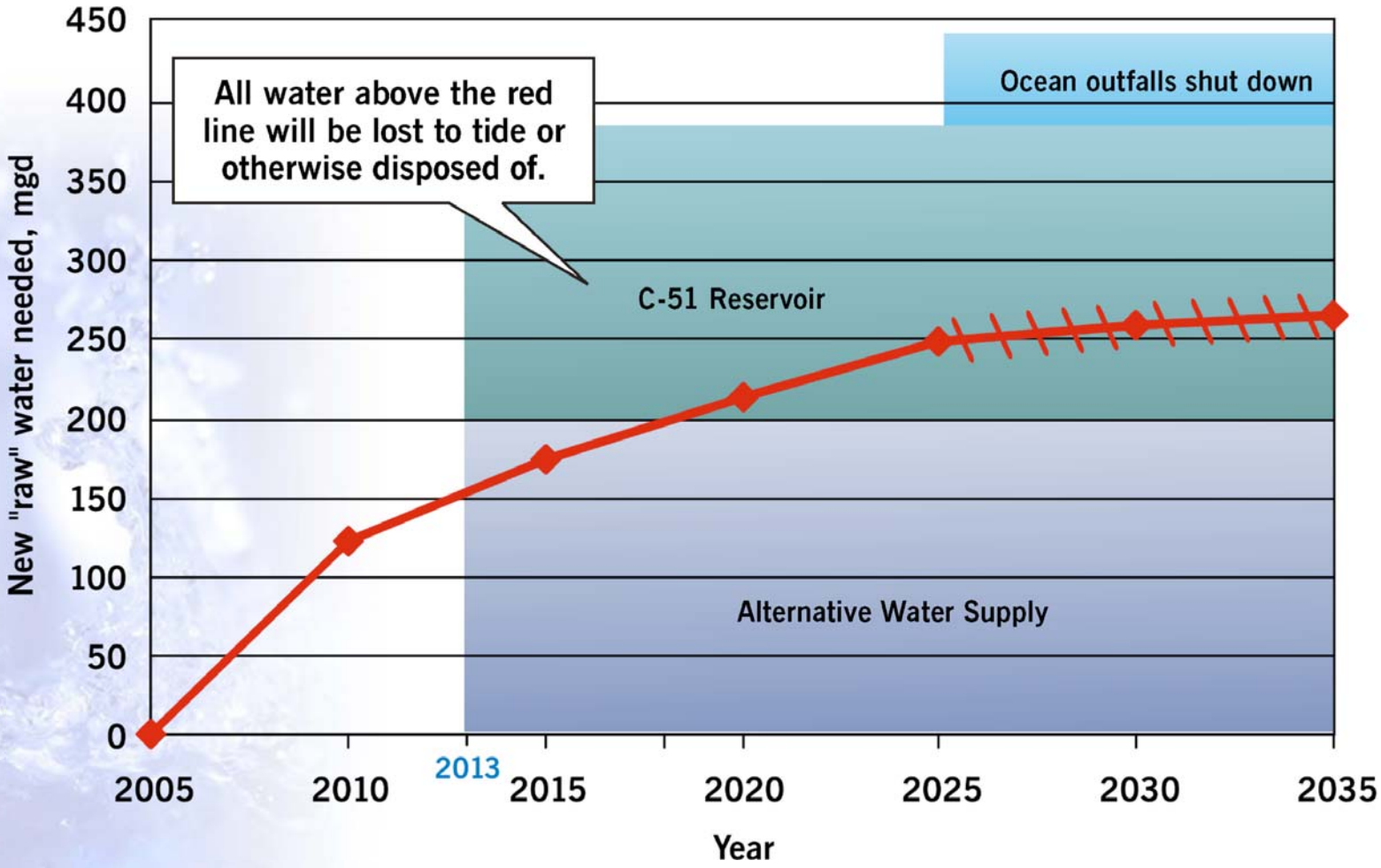
43000-036w-fn006

C-51 Reservoir



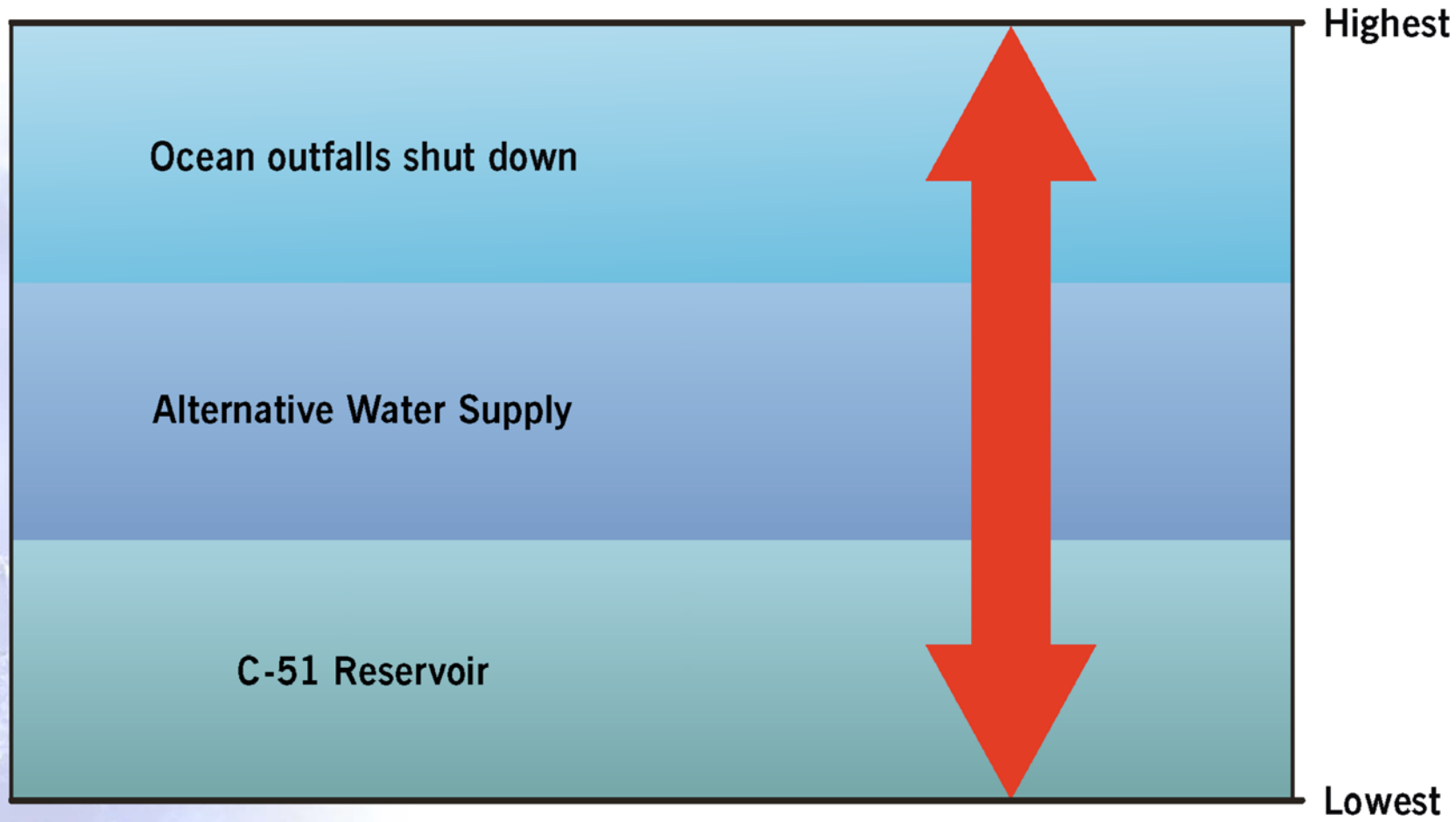
43000-036w-fn006

Legislated Shutdown of Ocean Outfalls



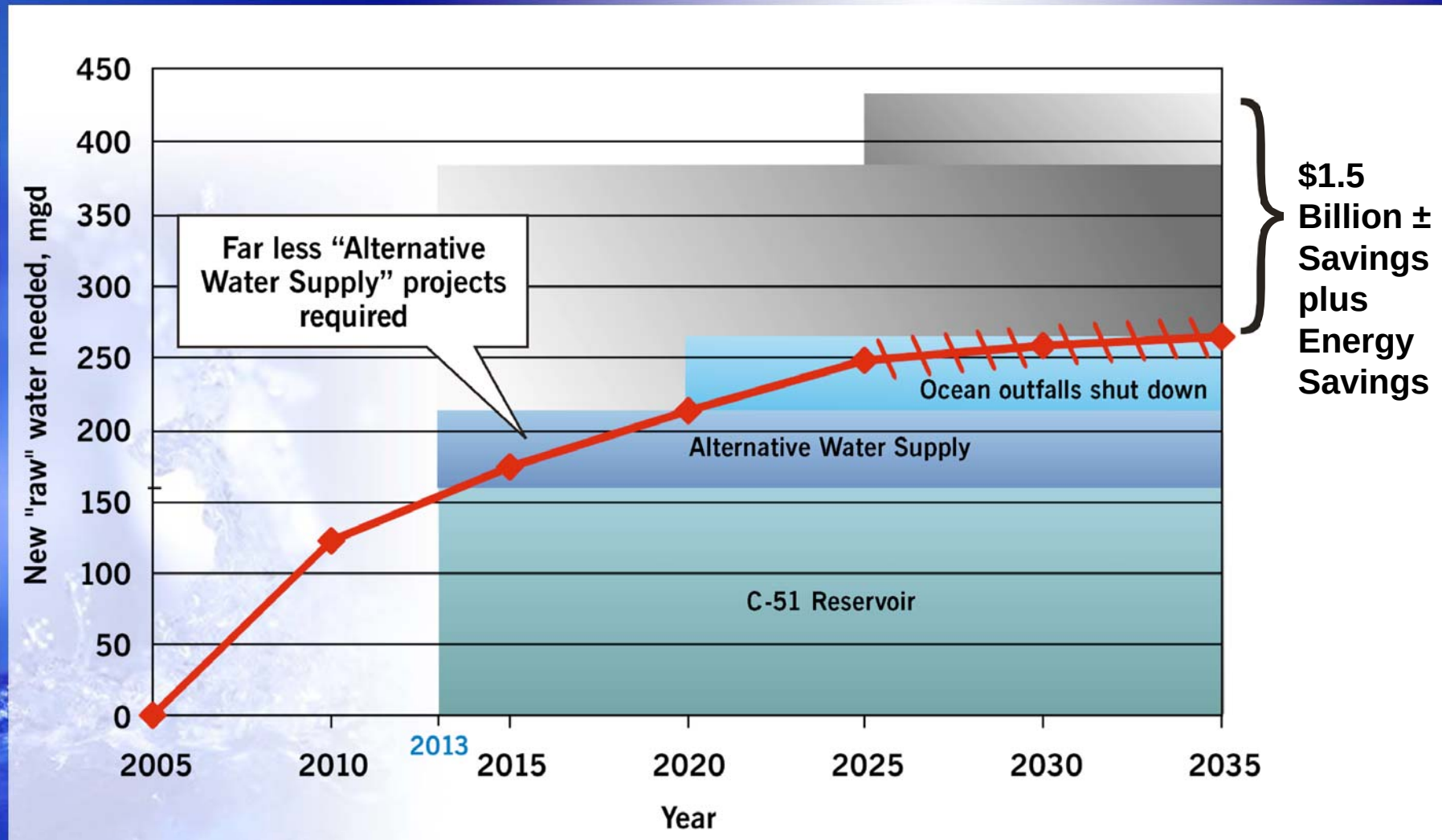
43000-036w-fn006

Relative Energy Use and Capital Costs of Alternatives



43000-036w-fn006

What if AWS projects were re-scheduled, optimizing sustainable design concepts?



43000-036w-fn006

Next Steps

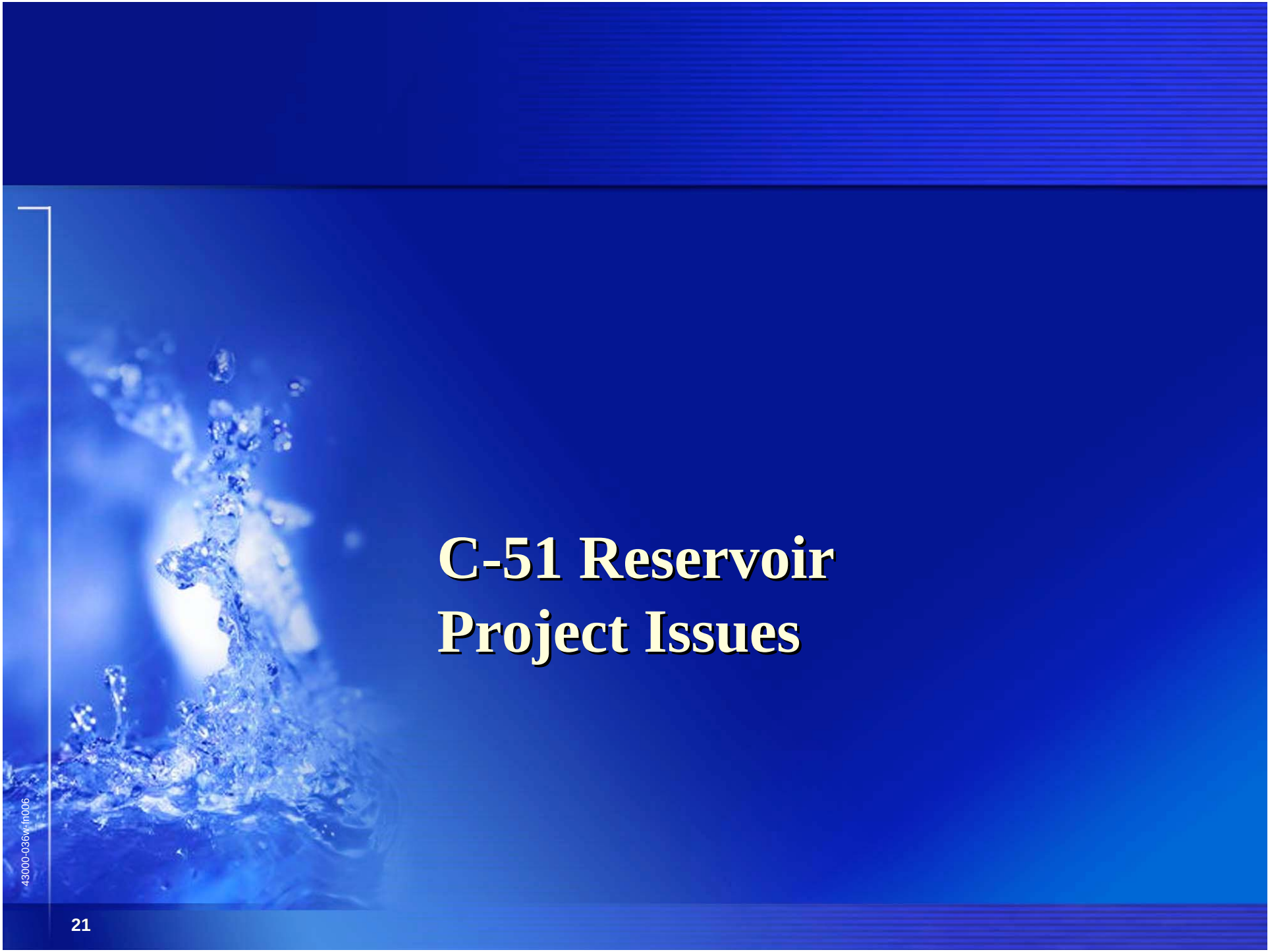
- Meet with Senior District staff to present Study
  - Leadership Roles
  - Additional Technical needs
  - Administrative/Legal framework
  - Develop Next Phase Scope

Next Steps – Technical

- WMD Optimization of model to determine allowable water credits from C-51 reservoir
- WMD Use of 2x2 model to evaluate performance of C-51 reservoir for regional environmental and water supply performance measures.
- WMD/Utilities Finalize Design elements

Next Steps – Administrative/Legal

- Costs C-51 reservoir and credits – identify vehicle for purchase
- Agreements
  - Utility District – Permit modifications with use of offset, schedule for applications, LEC plan update, DCA tie in
  - Identification of Legislative changes to allow long term permits/credits
  - Implementation process – rules – credit process, permit duration, service area
  - Property/District/Utility – design requirements, delivery schedule



C-51 Reservoir Project Issues

Entire Phase 2 Work Scope

- Update Utility Demand Projections
- Conveyance
- Permitting
- Environmental & Water Quality Analysis
- Geotechnical & Hydraulic Testing
- Full-Cost Accounting
- Legal & Regulatory Considerations
- Governance & Financing
- Schedule
- Offset Credits

Entire Phase 2 Key Decisions

- Will SFWMD include reservoir as an AWS Project in LECWSP?
- Will SFWMD allocate offset credit to utilities?
- Will SFWMD allow water supply source shifting?
- Will SFWMD expend resources to identify & use credits?
- Is LWDD willing to accept C-51 water?
- Who will fund, operate & maintain new system?


C-51 Reservoir Project
Phase 2A

Phase 2A Work Scope

1. Update Raw Water Demand Projections
2. Water Conveyance/Quality
3. Geologic/Hydrologic Data Compilation
4. Cost-effectiveness Sensitivity Analysis

Task 1 – Update Raw Water Demand Projections

- Update the water utility survey completed in early 2007
- Projections of raw water needed in 2015, 2020 and 2030
- Identify alternative water source commitments

Results:

- Technical Memorandum – Updated Raw Water Demands

Task 2 - Water Conveyance

- Quantify available water and its projected quality
- Provide a detailed evaluation of the proposed certification process and service area delineation
  - Compliance with the LEC Regional Availability Rule
- Evaluation of alternatives to convey water to the utilities
- Define “Cascaded”

Results: Preparation of three technical memoranda:

- Proposed Certification Process
- Direct Conveyance Alternatives

Task 3 - Geotechnical and Hydrologic Conditions

- Gather and review geologic and hydrologic information in the geographic area

Results:

- Technical Memorandum – Geologic and Hydrologic Investigation

Task 4 – Cost-Effectiveness Sensitivity Analysis

- Conceptual capital cost per gallon of capacity for water produced from the proposed C-51 Reservoir

Results:

- Technical Memorandum – Cost-Effectiveness Sensitivity Analysis

Phase 2A Work Scope
Budget and Deliverable Schedule

C-51 Reservoir Evaluation - Phase 2A
Hazen and Sawyer for City of Fort Lauderdale
Budget and Deliverable Schedule

Task and Technical Memorandum	Budget	Deliverable Date (No. of Weeks after Notice to Proceed)
1 - Update Raw Water Demand Projections	$24,203	9
2 - Water Conveyance	$31,792	10
3 - Geo and Hydro Conditions	$12,027	10
4 - Cost-Effectiveness Analysis	$6,089	12
Total Budget/Report	**$74,111**	

The remaining budget associated with the "Conceptual Feasibility of a Sub-Regional LEC Water Supply Solution" is $112,218 As of May 1, 2009.

Recommendations

- Move Forward with the C-51 Reservoir Project Phase 2A Project
- Continue working with SFWMD on the Project and development Phase 2A.

Discussion